MAX
CENTERS FOR MEDICARE & MEDICAID SERVICES

MEDICAID POLICY BRIEF

MATHEMATICA Policy Research

Brief 14 • December 2012

The Availability and Usability of Behavioral Health Organization Encounter Data in MAX 2009

Jessica Nysenbaum, Ellen Bouchery, Rosalie Malsberger

As an increasingly larger share of Medicaid enrollees receives behavioral health services through managed care arrangements, the encounter data that states receive from managed care organizations have the potential to provide researchers and policymakers with valuable insight into the care needs and service use of Medicaid managed care enrollees. However, not all states report encounter data, and for those that do, we know little about the quality and completeness of the data. This issue brief documents a detailed analysis of the behavioral health organization (BHO) encounter data in the 2009 Medicaid Analytic eXtract files (MAX 2009) and assesses the viability of using these data for research.

Introduction

Medicaid paid for 26 percent of all mental health (MH) and substance abuse (SA) services delivered in the United States in 2005, making it the largest source of payment for these services (Substance Abuse and Mental Health Services Administration 2010). Researchers and policymakers interested in studying the MH and SA services delivered and enrollees served under Medicaid require a reliable source of data. Medicaid Analytic eXtract (MAX) files contain data on Medicaid enrollment and service utilization in all states and the District of Columbia and are enhanced to support research, making them an excellent source of data for analysis of MH and SA treatment under Medicaid. The MAX files include data from managed care organizations (MCOs) that contract with states to provide services to beneficiaries in exchange for a flat capitation payment. These "encounter data" reflect services provided and diagnosis information, but not information on expenditures. Encounter data are becoming more important in research on Medicaid MH and SA service provision because these services are increasingly being delivered through comprehensive MCOs that contract to provide the full range of medical services (health maintenance organizations or HMOs) and by those that contract to provide only behavioral health services (BHOs). The percentage of Medicaid recipients enrolled in comprehensive managed care increased from 41 to 50 percent between 2004 and 2008 (Borck et al. 2012). The percentage enrolled in a BHO increased from 13 to 22 percent in the same period (Borck et al. 2012).

The availability, completeness, and quality of the MAX encounter data, however, have been reviewed only recently and only to a limited extent. This brief is one in a series that is intended to fill this gap, providing researchers and policymakers with information on encounter data in MAX so that they can make better decisions about whether to include these data in their analyses. The two prior briefs in this series (Dodd et al. 2012 and Byrd et al. 2012) examined the usability of encounter data for comprehensive MCOs in the MAX claims files, and the authors drew promising conclusions about the data's potential in this regard. This brief goes one step further by examining BHO encounter data in MAX 2009. It provides background on Medicaid MH

About This Series

The MAX Medicaid policy issue brief series highlights the essential role MAX data can play in analyzing the Medicaid program. MAX is a set of annual, person-level data files on Medicaid eligibility, service utilization, and payments that are derived from state reporting of Medicaid eligibility and claims data into the Medicaid Statistical Information System (MSIS). MAX is an enhanced, research-friendly version of MSIS that includes final adjudicated claims based on the date of service, and data that have undergone additional quality checks and corrections. CMS produces MAX specifically for research purposes. For more information about MAX, please visit: http://www.cms.gov/Research-Statistics-Data-and-Systems/Computer-Data-and-Systems/MedicaidDataSourcesGenInfo/MAXGeneralInformation.html.

and SA service coverage, Medicaid eligibility, and the impact of MH and SA delivery systems; describes methods for assessing the availability, completeness, and quality of the MAX encounter data; presents findings from our analysis of BHO enrollment, capitation, and encounter data; and summarizes our conclusions.

Background

To assess the availability and completeness of BHO encounter data, we compared the level of services reported for BHO enrollees in encounter data to the level of services reported in fee-for-service (FFS) claims for enrollees in states that provide behavioral health services through FFS. This comparison is not straightforward for several reasons. First, there is substantial variation between states, and thus between state-contracted BHO plans, in the behavioral health services covered by Medicaid. Second, the states also vary in terms of the subpopulations eligible for Medicaid and those enrolled in managed care. Finally, the services received by Medicaid enrollees with similar care needs may differ depending on whether they are delivered through a BHO or through FFS Medicaid.

Variation in MH and SA Service Coverage

Assessing the availability and completeness of BHO encounter data is complicated by state-to-state variation in Medicaid service coverage. According to federal guidelines, states must cover certain categories of services ("mandatory services"), and they may receive matching federal funds for other categories of services if they choose to cover them ("optional services"). Medically necessary inpatient hospital care and physician services for MH or SA are mandatory. The same is true for early and periodic screening, diagnostic, and treatment (EPSDT) services for individuals younger than 21 years old. MH and SA treatment needs identified as part of these screenings must be covered in all states. However, services for individuals age 22 to 64 in institutions for mental disease generally cannot be covered under Medicaid. Medicaid coverage of other MH and SA services is optional, which ultimately means that the services may be covered in some states but not in others. Optional MH and SA services include psychologist services, clinical social worker services, prescription drugs, personal assistance, diagnostic screening, rehabilitation and preventive services, outpatient hospital services, clinic services, community supports, service coordination, and case management. It is also noteworthy that states covering a specific benefit may vary greatly in the generosity of the benefit and limitations of coverage.

BHOs may contract with state Medicaid agencies to provide only a subset of the behavioral health services covered by the state. For example, the BHO might provide MH services while SA treatment services are covered through FFS. Colorado is an example of this arrangement. In addition, in states that use both comprehensive MCOs and BHOs to deliver services, both organizations may provide some level of coverage for MH and SA services. In these states, MCOs typically cover basic behavioral health services provided in primary care settings, whereas BHOs provide more specialized and complex services. For example, Michigan's MCOs cover outpatient mental health services, but the state also has BHOs, which cover specialized services such as community living supports, crisis interventions, and extended observation beds. In some states, specific providers or services (for example, Crisis and MH Rehabilitation in Iowa) may also be excluded from BHO coverage.

Variation in Behavioral Health Needs of Medicaid Enrollees

To receive federal matching funds, state Medicaid programs must cover all individuals in certain eligibility groups. States also have the option to cover individuals in certain additional groups who do not meet the income and resource thresholds set by the federal government for mandatory coverage. The mandatory groups include low-income women and children, low-income Medicare enrollees, and individuals eligible for the Supplemental Security Income (SSI) program. The optional groups include medically needy individuals, higher-income children and pregnant women, the institutionalized aged and disabled, and people eligible through 1115 demonstration waivers. These populations vary widely in their need for behavioral health services, and states vary in the degree to which they enroll each of these groups in managed care. We therefore analyzed the MAX data by basis-of-eligibility (BOE) category—adult, children, disabled, and aged—when making comparisons across states and plans.

Impact of BHOs on the Delivery of Medicaid Behavioral Health Services

Finally, the services received by Medicaid enrollees with similar care needs may differ depending on whether they are delivered through a BHO or through FFS Medicaid. BHOs may help states control behavioral healthcare costs (Shirk 2008). A review of the research from 1990 through 2005 (Mauery 2006) on managed MH care indicates that providing MH services through an MCO can reduce the cost of care. The techniques used by BHOs to reduce costs include prior authorization and medical necessity requirements, selective contracting with providers and transferring risk to their providers, and pharmacy benefit management. As a result, managed MH care organizations have been able to reduce the average number of outpatient visits per user, the probability of inpatient admissions, the length of stay for inpatient treatment, and the cost per unit of care. We consider these impacts on utilization when evaluating the comparisons of service use between BHOs and FFS Medicaid below.

Data and Methods

Several types of data are included in MAX for BHO plans. MAX includes enrollment data, capitation claims,[1] and encounter data for BHO plans, and all three types of data are needed for many analyses. However, reporting of BHO data varies significantly across states, and few states report all three types of data. Most states report BHO enrollment data, fewer report capitation data, and even fewer report encounter data. In addition, many states use multiple BHO plans to serve their Medicaid beneficiaries, and the availability of data varies by plan.

The analysis described here is based on an examination of MAX 2009 data for BHO enrollees and FFS enrollees. We restricted our analysis to enrollees eligible for full Medicaid benefits[2] and to BHO plans with at least 10 capitation claims and 10 encounter records. This threshold was set low so that most plans would be included in our initial analysis of completeness. Data for some BHO plans, such as those in Kansas, were reported under more than one plan identification number. Consequently, we combined the data reported in these plans.

Although FFS data in MAX has some completeness and quality issues, the information is generally considered to be usable for research. Therefore, to determine whether the BHO encounter data are also generally usable for research, we compared metrics of completeness and quality for BHOs to similar metrics for six states that primarily cover MH and SA services on a FFS basis: Alabama, Alaska, Arkansas, Illinois, Louisiana, and Mississippi. There are no BHOs in these states, and enrollment in comprehensive MCOs was very limited or nonexistent.[3]

We first examined BHO enrollment and capitation claim reporting in the 16 analysis states with BHOs. We then examined the completeness of encounter data reporting in each MAX claim file type: inpatient (IP), long-term care (LT), outpatient (OT) and prescription drugs (RX). While BHOs typically do not cover long-term care services, specialty psychiatric and SA hospital claims are reported in the LT file. We conducted an initial analysis on the volume of the RX and LT data, but did not conduct detailed analysis on these data types since only a small amount of data was reported. For those plans with substantial reporting, we assessed the quality of encounter data in the IP and OT files.

In the IP file, we calculated the number of claims per 1,000 person months of enrollment (PME).[4] In the OT file, we calculated the number of claims per PME, the percentage of BHO enrollees with any encounter records, and the number of claims per user of services. In states and files with sufficiently complete data, we analyzed data quality in both the OT and IP files by evaluating the percentage of claims that included a primary diagnosis, a principal procedure code, and a revenue code. In addition, in the IP file we also assessed the average length of stay and the average number of diagnosis and revenue codes reported on IP encounter claims.

We compared the data completeness and quality metrics for the BHO plans to reference ranges estimated on the basis of observed MH and SA claims and enrollment data in the six FFS states. The ranges represent the minimum and maximum value of the completeness and quality metrics observed in the individual FFS states in 2009. For example, the number of outpatient claims per enrolled month among the disabled ranged from 0.19 in Louisiana to 2.11 in Arkansas. State BHO encounter data was deemed sufficiently complete for analysis if the completeness metrics for each BOE group reported were within or exceeded the range for the FFS states. Because of the variation in MH and SA service coverage across the states, exceeding the range observed for the FFS states is likely to indicate that a state's coverage exceeds that of the FFS states analyzed. Thus, in our analysis of data quality, BHO plans whose metrics were within or exceeded the range observed for the FFS states were deemed to have met initial quality checks.

Using the 2009 National Summary of State Medicaid Managed Care Programs (CMS 2010), we divided BHO plans into two groups: those covering MH services and those covering both MH and SA services. In the OT file, psychiatric services are identified by the MAX type of service (TOS) code=53. The services identified by TOS=53 include counseling, therapy, assessment, crisis intervention, community supports, social rehabilitation, therapeutic foster care, electroshock/electroconvulsive therapy, cognitive behavioral therapy, partial hospitalization, crisis residential therapy, SA services, detoxification, services related to autism, and smoking cessation services. Because this group of services is similar to the services covered by many BHO plans, we used TOS=53 to identify the set of OT file comparison claims for the FFS states. For BHO plans that cover only MH services (plans in Colorado, Florida, and New Mexico), we limited FFS reference ranges to services for TOS=53 with a primary diagnosis code of MH. MH and SA claims in the IP file cannot be identified by TOS code because the psychiatric service type is used only in the OT file. MH and SA claims for FFS states in the IP file were identified based on whether they had an MH or SA primary diagnosis code.

Findings

In this section, we report the findings for the availability of enrollment and capitation data, the completeness of encounter data reporting, and the quality of the information reported on the encounter records.

Enrollment and Capitation Data Reporting

In 2009, 18 states operated BHO plans in their Medicaid program (Table 1).[5] However, data for only 16 of these states were available in MAX 2009 at the time of this study.[6] In addition, our initial analysis showed that Utah did not report enrollment data for its BHO. Most of the remaining 15 states reported enrollment in the BHO program for a majority of Medicaid beneficiaries in each eligibility category (adults, children, aged, and the disabled). However, the share of beneficiaries whose enrollment in BHOs was reported varied widely across the states, ranging from only six to seven percent of beneficiaries enrolled per eligibility group in North Carolina to universal enrollment in Washington (Table 2). In some states, a low enrollment rate reflects a BHO operating in a limited area. According to CMS's National Summary of State Medicaid Managed Care Programs, North Carolina's BHO operated in only five of 100 counties in 2009. In other states, a low enrollment rate may reflect the exclusion of certain subpopulations from enrollment. Across the 15 states, enrollment in BHOs was the least common for the aged. Many of these people are dual eligibles (those eligible for both Medicaid and Medicare), and because responsibility for covering services for these individuals is split between Medicaid and Medicare, they are less likely to be enrolled in a Medicaid managed care plan.

Of the 15 states that report enrollment in BHO plans in MAX 2009, 11 of them also report capitation data (Table 1).[7] With the exception of Michigan, all states that had multiple plans and that reported capitation data did so for every plan. We analyzed the ratio of capitation claims to person months of enrollment at the plan level. A ratio close to one indicates that a capitation payment was reported for nearly every month that a beneficiary was enrolled in a managed care plan. Most BHO plans with both enrollment and capitation data had capitation claims per enrolled month ranging from 0.75 to 1.25, a reasonably good range.

Table 1. Summary of Capitation and Encounter Data Reporting in States with BHOs, MAX 2009

State	Capitation Data Reporting		Encounter Data Reporting	
	Any Data Reported	All Plans Reporting	Any Data Reported	All Plans Reporting
Arizona	X	X	X	X
Colorado	X	X	X	
Florida	X	X	X	
Hawaii[a]	NA		NA	
Iowa	X	X	X	X
Kansas	X	X	X	X
Massachusetts	X	X		
Michigan	X			
Nebraska				
New Mexico	X	X	X	X
North Carolina	X	X	X	X
Oregon				
Pennsylvania	X	X		
Tennessee	X	X		
Texas				
Utah				
Washington				
Wisconsin[a]	NA		NA	
Total	**11**	**10**	**7**	**5**

Source: Mathematica analysis of the MAX 2009 PS, IP, LT, OT and RX files.
Note: At least 10 claims, by type, had to be present in the MAX files to count as being submitted.
[a] Hawaii and Wisconsin were excluded from the analysis because their MSIS files (the source for MAX files) were unavailable or contained significant data problems.

Encounter Data Reporting

Seven states with both enrollment and capitation data also reported BHO encounter data: Arizona, Colorado, Florida, Iowa, Kansas, New Mexico, and North Carolina (Table 3). North Carolina submitted only 24 encounter records, all in the OT file, and was dropped from the analysis. While we set the threshold for inclusion in the analysis for a particular plan to be 10 encounter and 10 capitation claims, we felt 24 encounter records for an entire state were too few to merit analysis. In addition, we identified substantial anomalous reporting in New Mexico.[8] Therefore, we dropped New Mexico from the analysis, and do not recommend using its reported IP and OT BHO encounter data. Of the five remaining states, the volume of encounter data varied substantially. Arizona submitted over 9 million BHO records, whereas Kansas submitted about 3,000. Variation was also evident in whether encounter data was submitted in all file types. All five states submitted encounter records in the OT file, four submitted data in the IP file (Arizona, Colorado, Florida, and Iowa), but only two submitted data in the RX file, and just two others submitted data in the LT files. Arizona was the only state to submit BHO encounter data in all four MAX claim file types. The absence of the data in the RX and LT files does not necessarily indicate a problem; BHO plans do not commonly cover drugs and may not provide the specialty psychiatric hospital services included in the LT file.

Table 2. Percentage of Medicaid Enrollees in BHOs by Basis of Eligibility, MAX 2009

	Adults	Children	Aged	Disabled
Arizona	90	92	61	76
Colorado	99	99	95	93
Florida	17	34	5	30
Iowa	62	100	3	98
Kansas	100	100	60	96
Massachusetts	41	35	2	35
Michigan	95	98	95	97
Nebraska	84	97	49	76
New Mexico	46	83	84	84
North Carolina	7	6	6	6
Oregon	96	95	88	92
Pennsylvania	97	97	55	96
Tennessee	100	100	100	100
Texas	9	13	6	11
Washington	100	100	100	100

Source: Mathematica analysis of MAX 2009.

Table 3. BHO Encounter Data in MAX 2009, by File Type

	OT Claims	IP Claims	LT claims	RX claims
Arizona	X	X	X	X
Colorado	X	X		
Florida	X	X		X
Iowa	X	X		
Kansas	X			
Massachusetts				
Michigan				
Nebraska				
New Mexico[a]	X[a]	X[a]	X	
New York				
North Carolina	X[b]			
Oregon				
Pennsylvania				
Tennessee				
Texas				
Washington				
Total	**7**	**5**	**2**	**2**

Source: Mathematica analysis of MAX 2009 IP, LT, OT, and RX files.
[a] New Mexico submitted BHO encounter data in the OT and IP file, but we identified substantial anomalous reporting, including dental and primary care claims labeled as BHO claims. Thus, we excluded the state from our analysis.
[b] There are only 24 OT BHO encounter records for North Carolina.

Encounter Data Completeness

Our analysis of encounter data completeness included only BHO plans that reported a substantial number of encounter records and had no substantial reporting anomalies identified in the IP and the OT files. For 3 plans out of 7 in Colorado and one plan out of 12 in Florida, no encounter data were reported despite substantial enrollment in the plan. Thus, our analysis of data completeness in Florida and Colorado is limited to reporting plans.

BHOs in four states (Arizona, Colorado, Florida, and Iowa) reported IP encounter data (Table 4). IP encounter claims for adults, children, and the disabled were reported in all four states. In three of the states, the reported number of encounters per 1,000 PME was within the range of the FFS states for all BOE groups. Iowa was the exception in that its rate of utilization was within the FFS range for the disabled group but exceeded the FFS range for adults and children. Based on the observed reporting rates, we conclude that the IP encounter data for these four states appears to be complete enough for analysis among plans reporting encounter data.

In the OT file, we examined three completeness measures: the number of claims per PME, the percentage of enrollees with an OT encounter record, and the number of OT claims per service user (Tables 5 and 6). In Arizona, the number of claims per PME was within the FFS reference range for children and the aged and exceeded this range for adults and the disabled. In addition, Arizona's data were within or slightly above the FFS ranges observed for the percentage of enrollees with an OT claim and the number of claims per user for all BOE groups with the exception of the percentage of enrollees with a claim for the aged group. It is possible that behavioral health service use in Arizona exceeded the level in the FFS states because Arizona is more generous in its coverage of behavioral health services. Arizona also covers an optional Medicaid eligibility group, childless adults, who may on average have greater need for behavioral health services than adults typically enrolled in Medicaid. Overall, the OT file encounter data for Arizona appear to be well reported. We therefore believe that these data are likely to be usable for analysis.

Iowa's number of OT file claims per enrolled month fell within the range of the FFS states for all BOE groups. Iowa's data for all eligibility groups was within or exceeded the FFS range for the percentage of enrollees with an OT encounter record and the number of claims per user. Based on these comparisons, we conclude that Iowa's data is complete enough for analysis.

Findings on the completeness of Florida's OT file data are mixed. The state's data did not fall within the FFS ranges for claims per month of enrollment for children and the disabled,

Table 4. Comparison of FFS and BHO IP Claims per 1,000 Months Enrolled, MAX 2009[a]

State	Disabled	Adults	Children	Aged
BHOs Covering MH and SA				
FFS Reference Range	0.70–10.10	0.05–1.73	0.01–0.70	0.13–3.20
Arizona	2.73	1.02	0.09	0.14
Iowa	3.71	1.90	0.87	NA
BHOs Covering Only MH				
FFS Reference Range	0.51–6.14	0.04–1.20	0.01–0.70	0.10–3.15
Colorado	1.20	0.12	0.22	NA
Florida	0.55	0.67	0.30	3.10

Source: Mathematica analysis of MAX 2009.
Note: Each BHO plan had to have at least 10 capitation and BHO encounter records to be included in this analysis. All plans were included in the analysis for Arizona, Iowa, and Kansas. Three plans out of 7 in Colorado and one plan out of 12 in Florida were excluded because they did not meet this threshold for encounter reporting, but they did have substantial reported enrollment.
[a] Because of the small number of IP claims per enrolled month, we scaled this metric by 1,000 for analysis.

Table 5. Comparison of FFS and BHO OT Claims Per Month Enrolled, MAX 2009

State	Disabled	Adults	Children	Aged
BHOs Covering MH and SA				
FFS Reference Range	0.19–2.11	0.02–0.22	0.05–0.44	0.04–0.34
Arizona	2.97	0.61	0.30	0.17
Iowa	0.40	0.19	0.12	0.11
Kansas[a]	0.00	0.00	0.00	0.00
BHOs Covering Only MH				
FFS Reference Range	0.18–1.85	0.01–0.13	0.05–0.41	0.02–0.28
Colorado	0.12	0.01	0.01	0.02
Florida	0.05	0.06	0.03	0.04

Source: Mathematica analysis of MAX 2009.
Note: Each BHO plan had to have at least 10 capitation and BHO encounter records to be included in this analysis. All plans were included in the analysis for Arizona, Iowa, and Kansas. Three plans out of 7 in Colorado and one plan out of 12 in Florida were excluded because they did not meet this threshold for encounter reporting, but they did have substantial reported enrollment.
[a] Kansas has two BHOs. One covers only MH services, and the other covers only SA services. Data for these two plans were combined for the completeness analysis. The state reported BHO encounter records for all BOEs, but the rate of OT claims per person-month of enrollment was less than .01 and was rounded to zero.

Table 6. Percentage of Enrollees with an OT File Claim and the Number of Claims per Service User, MAX 2009

	Percentage of Enrollees with an OT BHO Claim				Number of OT Claims per Service User			
State	Disabled	Adults	Children	Aged	Disabled	Adults	Children	Aged
BHOs Covering MH and SA								
FFS Reference Range	19.0–36.2	5.4–11.8	4.6–16.7	6.1–22.6	10.7–61.8	3.2–14.2	7.7–44.7	2.8–29.0
Arizona	38.8	13.1	6.9	4.7	80.0	38.6	39.5	36.9
Iowa	29.8	16.7	13.3	10.2	14.6	9.1	9.1	5.8
Kansas[a]	0.2	0.2	0.2	0.0	3.2	1.9	2.6	3.3
BHOs Covering Only MH								
FFS Reference Range	11.7–26.1	1.8–6.8	1.9–9.6	2.4–11.3	16.4–75.3	6.3–15.9	15.8–62.1	5.6–44.6
Colorado	8.5	1.7	1.9	1.5	12.9	4.6	5.8	11.5
Florida	3.0	3.5	3.8	3.0	13.1	10.0	5.0	9.4

Source: Mathematica analysis of MAX 2009.
Note: Each BHO plan had to have at least 10 capitation and BHO encounter records to be included in this analysis. All plans were included in the analysis for Arizona, Iowa, and Kansas. Three plans out of 7 in Colorado and one plan out of 12 in Florida were excluded because they did not meet this threshold for encounter reporting, but they did have substantial reported enrollment.
[a] Kansas has two BHOs. One covers only MH services, and the other covers only SA services. Data for these two plans were combined for the completeness analysis. The state reported BHO encounter records for all BOEs, but the percentage of enrollees with an OT claims was less than .01 and was rounded to zero for the aged.

but the data did fall within this range for adults and the aged. Florida's rates for the percentage of enrollees with an OT claim and the number of claims per user provide further evidence that data for children and the disabled may be incomplete. Yet on these measures, data for Florida's adults and the aged were comparable to data in FFS states. The lower number of overall claims in Florida (reflected in the claims per PME measure) may be due to incomplete reporting in a subset of plans because claims per PME varied substantially across the 11 BHO plans reporting encounter data in Florida. Overall, OT data for Florida may be usable for research, but analysts should be cautious in doing so and may need to limit their analysis to plans with substantial OT file reporting.

The observed OT file utilization metrics for Kansas and Colorado were substantially below the range observed in the FFS states.[9] The observed difference in utilization is too large to be fully related to reductions in care resulting from BHO care management practices. Thus, the OT encounter data in these states did not meet the thresholds created for this analysis, and the data reported in these states is likely to be incomplete.

Encounter Data Quality

We reviewed the quality of BHO encounter data in four states (Table 7). We did not include Kansas because it reported no IP file data and very few OT file claims per enrolled month. For states that had multiple plans reporting, the quality of the data was reviewed by plan, limiting our analysis to plans with at least 10 encounter records in a given file. For the OT file, we reviewed whether at least one diagnosis code and one procedure code were listed on the encounter records. Among the FFS comparison states, nearly 100 percent of OT claims had at least one diagnosis code and at least one procedure code. In Arizona, Iowa, and Colorado, all OT file encounter records had at least one diagnosis and one procedure code. Florida reported encounter data for 11 plans; the share of encounter records with a diagnosis code ranged from 76.0 to 85.7 percent across the plans. For all of Florida's plans, over 95 percent of encounter records had a procedure code.

For the IP file, we assessed quality on the basis of encounters for which there was at least one diagnosis code and one revenue code.[10] We also looked at whether reported length of stay, number of diagnosis codes per claim, and number of revenue codes per claim were in a range that was similar to the FFS comparison states. Nearly all of the IP encounter records reported in Arizona, Colorado, and Florida had a diagnosis code and a revenue code. However, only 6 of the 11 plans reporting in Florida reported 10 or more IP encounter records. In Iowa, all IP encounter records included a diagnosis code, but none included revenue codes.

Average length of stay varied widely across the plans, ranging from 4.1 to 15.5 days per stay. The variation may be related to differences in severity of illness across the population enrolled, in the proportions of various populations enrolled (for example, disabled versus children), and in the levels and types of care covered by a plan. For all the BHO plans, the average number of diagnosis codes reported was within the range for the FFS states. In Arizona and Colorado, the average number of revenue codes reported was in the range for the FFS states. In Florida, the number of revenue codes reported per claim exceeded the number reported in the FFS states for almost every plan. As noted previously, Iowa reported no revenue code information on the IP encounter data.

Caveats

In our analysis, we used selected FFS-based metrics to make a preliminary judgment about the completeness and quality of BHO encounter data. These metrics were limited to the experience of only six FFS states. In addition, FFS data are not without quality issues. We reviewed information on data reporting issues in the FFS states and did not find any significant issues. However, if the FFS data have unknown problems, conclusions about the encounter data based on the FFS data may be misleading. Data users should also be mindful of the fact that we conducted a preliminary analysis across plans, states, and populations. Because of variation in service coverage and populations served in the FFS states and BHO plans, we accepted a broad range of values for many of the metrics. A state's or plan's data may meet our broad ranges although data for specific subpopulations or services were not reported. Thus, more comprehensive and targeted validation of the data should be undertaken before conclusions are drawn about the suitability of BHO encounter data for a particular study.

Table 7. Analysis of Encounter Data Coding Quality, MAX 2009

Plan	Percentage of OT Claims		Percentage of IP Claims		Average Among IP Claims		
	With Principal Diagnosis Code	With Principle Procedure Code	With Principal Diagnosis Code	With Initial Revenue Code	Length of Stay	Number of Diagnosis Codes	Number of Revenue Codes
BHOs Covering MH and SA							
FFS Reference Range	97.9–100.0	99.0–100.0	100.0–100.0	77.2–100.0	4.7–11.1	1.7–6.7	2.9–5.8
Arizona-079999	100.0	100.0	100.0	99.7	15.5	2.4	4.0
Iowa-0177394	100.0	100.0	100.0	0.0	5.7	1.9	0.0
BHOs Covering Only MH							
FFS Reference Range	100.0–100.0	99.1–100.0	100.0–100.0	76.9–100.0	5.8–12.1	1.7–6.4	2.7–7.9
Colorado							
04033007	100.0	100.0	NA	NA	NA	NA	NA
04034062	100.0	100.0	100.0	99.7	10.2	5.0	5.0
40358313	100.0	100.0	NA	NA	NA	NA	NA
95122567	100.0	100.0	NA	NA	NA	NA	NA
Florida							
015030400	80.3	95.7	NA	NA	NA	NA	NA
720029300	83.6	96.7	100.0	100.0	6.7	3.9	8.9
720029302	82.4	97.1	NA	NA	NA	NA	NA
720029303	81.4	96.8	NA	NA	NA	NA	NA
720030700	82.0	96.7	100.0	100.0	5.8	2.8	8.8
720032300	81.4	96.8	NA	NA	NA	NA	NA
725000200	81.5	96.7	100.0	100.0	4.1	3.1	7.6
725000201	76.0	95.2	100.0	100.0	5.6	3.7	8.8
725000202	84.3	97.2	100.0	100.0	5.3	3.7	9.0
725000203	85.7	97.0	100.0	100.0	4.7	3.1	8.7
725000204	81.7	96.8	NA	NA	NA	NA	NA

Source: Mathematica analysis of MAX 2009.
Note: Each BHO plan had to have at least 10 BHO encounter records in the respective file to be included in this analysis.

Conclusions

The initial assessment of the availability, completeness, and quality of BHO encounter data in MAX 2009 suggests that only limited data are available and usable. Although 18 states operated BHOs in 2009, complete capitation data are currently available for only 10 states. IP encounter data are available for four states (Arizona, Colorado, Iowa, and Florida), and preliminary analysis indicates that these data are sufficiently complete for analysis (Table 8). These data generally have high quality reporting in commonly analyzed fields, although data for Iowa are missing revenue codes (Table 7). OT file encounter data are available for five states, but our analysis suggests the data are only sufficiently complete for analysis in Arizona and Iowa.

The findings for Florida were mixed. At the state level the Florida encounter data do not appear complete; however, reporting varied by plan and may be sufficiently complete for analysis for a subset of plans.

Although Medicaid is the largest source of payment for MH and SA services, and almost a quarter of Medicaid enrollees received care through a BHO plan in 2008, the MAX 2009 data are very limited in terms of assessing the efficacy of the services provided through BHOs. Reporting by states of accurate and complete encounter data into MSIS will be increasingly vital for behavioral health research—especially as the use of managed care in the Medicaid program is further expanded.

Table 8. Summary of Encounter Data Completeness and Quality Findings, MAX 2009

State	OT File		IP File	
	Completeness	Quality	Completeness	Quality
Arizona	Data sufficiently complete for analysis	Data met initial quality checks	Data sufficiently complete for analysis	Data met initial quality checks
Colorado	Data appear incomplete	Data met initial quality checks	Data sufficiently complete for analysis for 4 plans (out of 7)	Data met initial quality checks for 1 plan (out of 7)
Florida	Data appear incomplete[b]	Data quality varied by BHO plan	Data sufficiently complete for analysis for 11 plans (out of 12)	Data met initial quality checks for 6 plans (out of 11)
Iowa	Data sufficiently complete for analysis	Data met initial quality checks	Data sufficiently complete for analysis	Data are missing revenue codes
Kansas[a]	Data appear incomplete	Data were not analyzed	No data submitted	No data submitted
New Mexico	Data reported were anomalous and were not analyzed	Data were not analyzed	Data reported were anomalous and were not analyzed	Data were not analyzed
North Carolina	Very few claims were reported	Data were not analyzed	No data submitted	No data submitted

Source: Mathematica analysis of MAX 2009.

Note: Each BHO plan had to have at least 10 capitation and BHO encounter records to be included in this analysis. All plans were included in the analysis for Arizona, Iowa, and Kansas. Three plans out of 7 in Colorado and one plan out of 12 in Florida were excluded because they did not meet this threshold for encounter reporting, but they did have substantial reported enrollment.

[a] We did not analyze Kansas' data for quality because it reported no IP file data and very few OT file claims per enrolled month.

[b] Data appear to be incomplete overall for the 11 plans reporting encounter data in Florida. Reported claims per person-month of enrollment varied substantially by plan. Reporting for a subset of plans may be complete.

References

Borck, R., A. Dodd, A. Zlatinov, S. Verghese, R. Malsberger, and C. Petroski. "The Medicaid Analytic Extract 2008 Chartbook." Washington, DC: CMS, 2012.

Byrd, Vivian L.H., Allison Hedley Dodd, Rosalie Malsberger, and Ashley Zlatinov. "Assessing the Usability of MAX 2008 Encounter Data for Enrollees in Comprehensive Managed Care." Washington, DC: CMS, July 2012.

Buck, J.A. "The Looming Expansion and Transformation of Public Substance Abuse Treatment Under the Affordable Care Act." *Health Affairs*, vol. 30, no. 8, August 2011, pp. 1402-1410.

Centers for Medicare & Medicaid Services. "2009 National Summary of State Medicaid Managed Care Programs." Baltimore, MD: CMS, Data and Systems Group.

Dodd, A.H., J. Nysenbaum, and A. Zlatinov. "Assessing the Usability of the MAX 2007 Inpatient and Prescription Encounter Data for Enrollees in Comprehensive Managed Care." Washington, DC: CMS, April 2012.

Mauery, D.R., L. Vaquerano, R. Sethi, J. Jee, and L. Chimento. "Managed Mental Health Care: Findings from the Literature, 1990-2005." DHHS Pub. No. SMA-06-4178. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2006.

Shirk, Cynthia. "Medicaid and Mental Health Services." National Health Policy Forum. Background Paper No. 66. October 23, 2008.

Substance Abuse and Mental Health Services Administration. "National Expenditures for Mental Health Services and Substance Abuse Treatment, 1986-2005." DHHS Pub. No. SMA-10-4612. Rockville, MD: SAMHSA, 2010.

Endnotes

[1] Capitation claims are records showing the amount Medicaid pays to health plans per enrollee per month for all services covered by the managed care plan.

[2] People with missing eligibility information and Medicaid beneficiaries in the following restricted-benefit eligibility categories were excluded from our analysis: S-CHIP only, family planning only, aliens with restricted benefits only, duals with restricted benefits only, and prescription drug only. Also excluded were other people enrolled as a restricted-benefit group whose only benefit from Medicaid is that the program pays their premiums for purchasing private health insurance coverage.

[3] In these states, we excluded from our analysis the small number of enrollees in comprehensive MCOs, including enrollment in Program for All-Inclusive Care for the Elderly (PACE).

[4] This measure was scaled by 1,000 because of the small number of claims per PME for inpatient services.

[5] Georgia reported its PASARR plan as a BHO in MAX 2009 and submitted enrollment and encounter records for this plan. However, according to the National Summary of State Medicaid Managed Care Programs, this plan became a FFS arrangement in 2007 and was phased out in 2009. Therefore, we excluded Georgia from our analysis.

[6] Creating a MAX file requires seven quarters of state reporting of Medicaid eligibility and claims data into MSIS. When data submissions are delayed, or when initial submissions are not approved because of quality concerns, the MAX file is delayed as well. Hawaii and Wisconsin had BHO plans in 2009, but the data were not available for analysis.

[7] New York reported a small number of BHO capitation claims, but because the state did not have a BHO in 2009, these data were a reporting error.

[8] Dental and primary care services appear to have been incorrectly assigned to the BHO plan.

[9] Kansas was only within the FFS range for the aged group for the number of claims per service user. Colorado was below the FFS range for claims per enrolled month for the disabled and children and at the bottom of this range for adults and the aged. However, the state was below the FFS range for the percentage of enrollees with a claim for all BOE groups except children, where it was at the bottom of the range. Colorado was below the FFS range for the number of claims per service user for all BOE groups except the aged.

[10] We initially reviewed procedure coding on the BHO encounter and comparison FFS state IP file claims, but less than half of claims in the FFS comparison states included a procedure code and in one of the FFS states only 3.8 percent of claims included a procedure code.

For further information on this issue brief series, visit our website at www.mathematica-mpr.com

Princeton, NJ • Ann Arbor, MI • Cambridge, MA • Chicago, IL • Oakland, CA • Washington, DC